Press release

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MITSUI E&S Commences Full-Scale Ammonia Testing

First commercial ammonia two-stroke engine takes next step towards market entry

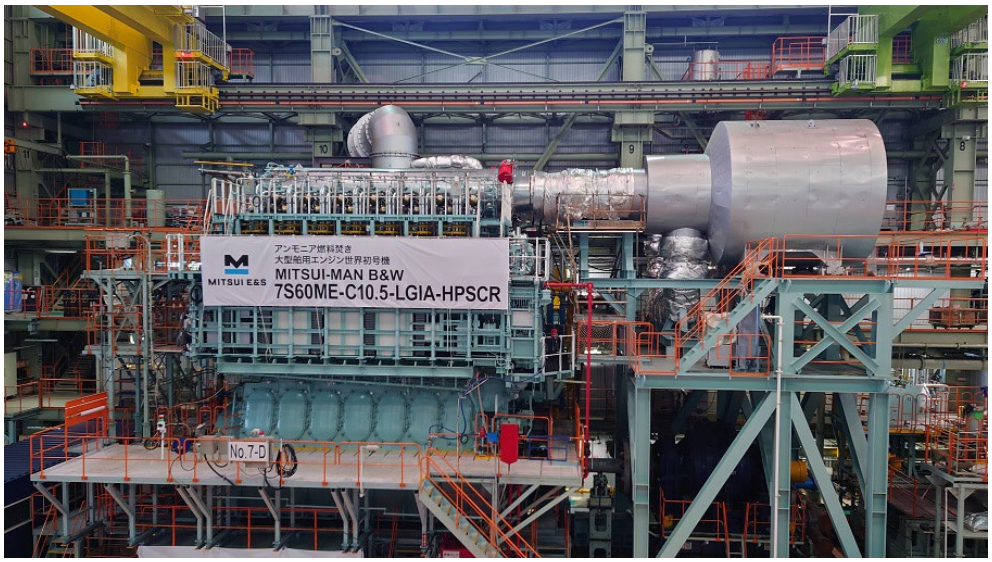
MITSUI E&S has announced the beginning of the test phase for the world's first commercial, two-stroke, dual-fuel ammonia engine. The MAN B&W 7S60ME-LGIA (-Liquid Gas Injection Ammonia) Mk 10.5 prototype engine began its ammonia fuel test-run at MITSUI E&S's Tamano Factory in Japan.

The 60-bore engine will eventually be installed aboard a 200,000-dwt bulk carrier at Imabari Shipbuilding for a joint venture between "K" LINE, NS United and ITOCHU Corp. It also features MAN Energy Solutions' proprietary HPSCR (High Pressure Selective Catalytic Reduction) system for IMO Tier III compliance.

Bjarne Foldager – Head of Two-Stroke Business – MAN Energy Solutions, said: "The use of ammonia, which can achieve carbon-neutral combustion when bio-fuel oil is used as pilot oil, is a significant milestone on the path towards decarbonisation, especially in the maritime industry where reducing greenhouse gas emissions is a pressing issue. We have worked closely with MITSUI E&S on this pioneering project and have noted keen interest in its progress from external parties. To date, MAN Energy Solutions has secured several ammonia engine orders throughout Asia and we are confident that ammonia will comprise one of the three major alternative fuels on the market – alongside methanol and methane."

The test phase also includes verification of the safety and performance of MITSUI E&S's independently-developed ammonia fuel-supply system, as well as other, peripheral systems.

Ole Pyndt Hansen, Head of Two-Stroke R&D, MAN Energy Solutions, said: "MITSUI E&S's test builds on the results of comprehensive single-cylinder ammonia-fuel tests conducted at our Research Centre Copenhagen and it is exciting to see this project draw closer to commercial fruition. As a fuel, ammonia's particular characteristics demand a careful approach and we have taken every precaution in reaching this point where we are comfortable handling it. Operational experience at sea will be key to fine-tuning the engine's performance and reliability, and thus its market introduction will be subject to a positive service experience. We expect a market introduction of our 50-, 60-, 70- and 80-bore ME-LGIA ammonia engines by the end of 2026, but the exact timing will be subject to the respective shipbuilding schedules."



The 7S60ME-LGIA ammonia dual-fuel prototype engine pictured at the Tamano Factory (picture courtesy MITSUI E&S)

MAN Energy Solutions enables its customers to achieve sustainable value creation in the transition towards a carbon neutral future. Addressing tomorrow's challenges within the marine, energy and industrial sectors, we improve efficiency and performance at a systemic level. Leading the way in advanced engineering for more than 250 years, we provide a unique portfolio of technologies. Headquartered in Germany, MAN Energy Solutions employs some 14,000 people at over 120 sites globally. Our after-sales brand, MAN PrimeServ, offers a vast network of service centres to our customers all over the world.